

R E M A R K S

Reconsideration of this application is respectfully requested.

The Examiner acknowledges on page 2 of the Office Action that USP 6,196,869 (previously cited "Peterzell") does not disclose the specific charge control structure recited in independent claim 8, although the Examiner continues to assert that Peterzell does disclose the general structure of an overdischarge control circuit, an overcharge control circuit and a charge control circuit as recited in claim 8.

The Examiner has cited USP 6,124,700 (newly cited "Nagai et al") to supply the missing teachings of Peterzell.

According to the present invention as recited in independent claim 8, a battery pack with a charge control function is provided which comprises an overdischarge control circuit (210) that detects an overdischarge mode of a secondary battery (70) and supplies an overdischarge detection signal to a discharge control switch (40) when the overdischarge mode is detected. In addition, the battery pack comprises an overcharge control circuit (220) that detects an overcharge mode of the secondary battery (70) and supplies an overcharge detection signal to a charge control switch (30) when the overcharge mode is detected, and a charge control circuit that performs charge control of the secondary battery by controlling the charge control switch (30).

According to the present invention as recited in independent claim 8, moreover, the charge control circuit comprises a constant-current control circuit (610) which controls the charge control switch (30) so as to keep the potential difference across the current-detecting resistor (R) at a predetermined value in order to charge the battery pack (100) at a constant current. The charge control circuit also comprises a constant-voltage control circuit (620) which detects a battery voltage of the secondary battery (70) and which controls the charge control switch (30) so that the battery voltage $V_{cc}(ba)$ does not exceed a predetermined voltage in order to charge the battery pack. And the charge control circuit also comprises a primary overvoltage detection circuit (610) which detects a primary voltage, and which turns off the charge control switch (30) and stops charging when the primary voltage $V_{cc}(ad)$ is an overvoltage.

Significantly, according to the present invention as recited in independent claim 8, the charge control element (30) for performing overcharge control is the same as the charge control element (30) for performing charge control (via the constant-current control circuit, the constant-voltage control circuit and the primary overvoltage detection circuit).

It is respectfully submitted that the cited references still clearly do not disclose, teach or suggest this significant feature of the claimed present invention.

Peterzell discloses a charge protection circuit (IC 28, with overdischarge output 38 and overcharge output 36), a discharge control switch, and a charge control switch. However, Peterzell does not disclose, teach or suggest a charge control element (FET), to which a signal is sent when overcharge is detected, which is also controlled by a constant-current control circuit and a constant-voltage control circuit. Accordingly, it is respectfully submitted that Peterzell clearly does not disclose, teach or suggest a charge control element that controls both the overcharge protection circuit and the charge control circuit, as according to the present invention as recited in independent claim 8. With the structure disclosed by Peterzell, both a charge control element for controlling the overcharge protection circuit and another charge control element for controlling the charge control circuit are necessary.

Nagai et al discloses a charge control circuit including a constant-current circuit, a constant voltage circuit, and a primary overvoltage detecting circuit. However, Nagai et al does not disclose, teach or suggest a charge control element that controls both the overcharge protection circuit and the charge control circuit. And with the structure of Nagai et al, both a charge control element for controlling the overcharge protection circuit and another charge control element for controlling the charge control circuit are necessary. Accordingly, it is

respectfully submitted that Nagai et al also does not disclose, teach or suggest the feature of the present invention as recited in independent claim 8 whereby the charge control element (30) for performing overcharge control is the same as the charge control element (30) for performing charge control (via the constant-current control circuit, the constant-voltage control circuit and the primary overvoltage detection circuit).

It is respectfully pointed out, moreover, that the Examiner has cited Peterzell for the disclosure of a charge control circuit, and that the Examiner has cited Nagai et al for the disclosure of the features of the charge control circuit of the present invention. That is, the Examiner has relied on different references to supply separate disclosures of the features of the present invention. However, according to the claimed present invention, the same charge control element is provided for both the overcharge control circuit and the charge control circuit, and it is respectfully submitted that the separate disclosure of the overcharge control and charge control in Peterzell and Nagai et al clearly does not suggest using the same charge control element for both an overcharge protection circuit and a charge control circuit.

Mino, moreover, has merely been cited for the disclosure of heat detection elements. And it is respectfully submitted that

Mino also does not disclose, teach or suggest the features of the present invention as recited in independent claim 8.

In view of the foregoing, it is respectfully submitted that the present invention as recited in independent claim 8, and claims 2 and 4-7 depending therefrom, clearly patentably distinguishes over Peterzell Nagai et al and Mino, taken singly or in any combination, under 35 USC 103.

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Allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned for prompt action.

Respectfully submitted,

/Douglas Holtz/

Douglas Holtz
Reg. No. 33,902

Frishauf, Holtz, Goodman & Chick, P.C.
220 Fifth Avenue - 16th Floor
New York, New York 10001-7708
Tel. No. (212) 319-4900
Fax No. (212) 319-5101

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